

## **EXHIBIT 66**

### **Declaration of Nilay Tanik Argon**

**IN THE UNITED STATES DISTRICT COURT  
FOR THE MIDDLE DISTRICT OF NORTH CAROLINA  
CASE NO. 1:14-CV-954**

**STUDENTS FOR FAIR  
ADMISSIONS, INC.,**

**Plaintiff,**

**v.**

**UNIVERSITY OF NORTH  
CAROLINA et al.,**

**Defendants.**

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**DECLARATION OF NILAY TANIK ARGON**

## DECLARATION OF NILAY TANIK ARGON

I, Nilay Tanik Argon, hereby make this declaration from my personal knowledge and, if called to testify to these facts, could and would do so competently:

### **Background**

1. I am an Associate Professor in the Department of Statistics and Operations Research at The University of North Carolina at Chapel Hill (UNC-CH). I am the first tenured female faculty member in my department.

2. I received my Bachelor of Science and Master of Science in Industrial Engineering at Middle East Technical University in Turkey. I then received a Master of Science in Operations Research and a Ph.D. in Industrial and Systems Engineering at the Georgia Institute of Technology.

3. My research interests include: Stochastic modeling and analysis of manufacturing and service systems; optimal control of queueing systems; healthcare operations management; and statistical output analysis for computer simulation. I have more than fifteen peer reviewed publications and have received several research grants. I recently received a National Science Foundation collaborative research grant to study distribution of patients to medical facilities in mass casualty events.

4. I teach the following courses: STOR 113 Decision Models for Economics; STOR 445 Stochastic Models in Operations Research; STOR 465 Simulation Analysis and Design; STOR 641 Stochastic Models in Operations Research; STOR 762 Discrete Event Simulation; and STOR 890 Design and Control of Queueing Systems with Applications to Manufacturing and Healthcare.

5. I am a white female. I am originally from Turkey.

6. Argon Declaration Exhibit 1 is a true and correct copy of my curriculum vitae.

Argon Declaration Exhibit 2 is a photograph of me from my UNC-CH webpage.

### **Experience With Diversity at UNC-CH**

7. Women and minorities are very underrepresented in the field of statistics and operations research. I believe that we need more diversity at UNC-CH and more diversity in my field. Greater diversity would improve the learning experience for all students and would make sure that our field has the best minds available.

8. I teach first year students and seniors. My freshman calculus class has 100 students in it, and only three or four of them are underrepresented minority students.

9. Often, it is white students who ask questions in class. I try to inspire the minority students to ask questions. Sometimes, I have the impression that minority students in this class may be too intimidated to ask questions in class. This impedes the learning of all students, because if a student is not understanding something, there are likely others who also do not understand, and everyone could benefit from the question.

10. At the senior level, I teach mathematical decisions. In this course, a number of my students are Chinese. Females make up one third of the class. It is rare for me to have underrepresented minority students in this upper level course.

11. In my upper level courses, I have noticed that some of my international students get annoyed when white American students ask questions, but I encourage the international students to ask questions too, because cross-cultural learning is important. My American students get to see the discipline that these international students typically have in their studies, and I have noticed that international students tend to write better after interacting with my American students.

12. In my simulations class, the students do group projects, and I try to mix male and female students in the groups. In completing these group projects, students learn presentation and social skills, which are skills critical in seeking jobs.

13. Underrepresentation of minorities is a major issue in statistics and operations research at the undergraduate and graduate levels. In my 10 years of teaching at UNC-CH, our department has had only one Black graduate student. Our department has had only 2-3 Latino/a graduate students. I do not recall having any Native graduate students in the department.

14. I attribute the lack of diversity to the culture and some climate issues.

15. I am committed to increasing diversity in our department and in statistics and operations research generally. I am a diversity liaison, and I represent my department at diversity meetings. I also arrange events for female graduate students and attend diversity-related workshops and seminars.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct.

Executed on: 6/14/2017



Nilay Tanik Argon

## **Exhibit 1 to Argon Declaration**

## CURRICULUM VITAE

**Nilay Tanık Argon**

Last Revision: April 24, 2017

**CONTACT INFORMATION:**

**Address:** Department of Statistics and Operations Research  
 University of North Carolina at Chapel Hill  
 336 Hanes Hall, CB#3260  
 Chapel Hill, NC 27519-3180, USA

**Phone:** 919-962-3834 (Office)  
 919-699-5630 (Mobile)

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**E-mail:** nilay@unc.edu

**RESEARCH INTERESTS:**

- Stochastic modeling and analysis
- Health-care operations with an emphasis on emergency care and management
- Design and control of queueing systems
- Statistical output analysis for computer simulation

**TEACHING INTERESTS:**

- Stochastic processes and queueing theory
- Simulation modeling and analysis
- Probability and statistics

**EDUCATIONAL BACKGROUND:**

<b>Georgia Institute of Technology, Atlanta, GA, USA</b>	<b>2002</b>
Ph.D. in Industrial and Systems Engineering (Advisor: S. Andradóttir)	
Minor: Mathematics	
<b>Georgia Institute of Technology, Atlanta, GA, USA</b>	<b>2000</b>
M.S. in Operations Research	
<b>Middle East Technical University, Ankara, Turkey</b>	<b>1998</b>
M.S. in Industrial Engineering	
<b>Middle East Technical University, Ankara, Turkey</b>	<b>1996</b>
B.S. in Industrial Engineering	
Rank: First among 105 Senior Year Students	

## PROFESSIONAL EXPERIENCE AND EMPLOYMENT:

<b>University of North Carolina at Chapel Hill, NC, USA</b> Associate Professor of Statistics and Operations Research	<b>January 2013 – Present</b>
<b>University of North Carolina at Chapel Hill, NC, USA</b> Assistant Professor of Statistics and Operations Research	<b>July 2006 – December 2012</b>
<b>University of Wisconsin – Madison, WI, USA</b> Assistant Professor of Industrial Engineering	<b>January 2003 – June 2006</b>
<b>Georgia Institute of Technology, Atlanta, GA, USA</b> Graduate Research Assistant, Instructor	<b>Fall 1998 – Fall 2002</b>
<b>Middle East Technical University, Ankara, Turkey</b> Graduate Research and Teaching Assistant	<b>Fall 1996 – Summer 1998</b>
<b>Arçelik Dishwasher Plant, Ankara, Turkey</b> Summer Intern	<b>Summer 1995</b>
<b>Turkish Aerospace Industries (TAI), Ankara, Turkey</b> Summer Intern	<b>Summer 1994</b>

## JOURNAL PUBLICATIONS:

(\* indicates a co-author who was a student at the time of research.)

1. Ahalt\*, V., **N. T. Argon**, S. Ziya, J. Strickler, and A. Mehrotra, "Comparison of Emergency Department Crowding Scores: A Discrete-Event Simulation Approach." To appear in *Health Care Management Science*.
2. **Argon, N. T.**, C. Deng\*, and V. Kulkarni, "Optimal Control of a Single Server in a Finite-Population Queueing Network." *Queueing Systems* **85** (2017), No. 1, 149-172.
3. Mills\*, A. F., **N. T. Argon**, S. Ziya, B. Hiestand, and J. Winslow, "ReSTART: A Novel Framework for Resource-Based Triage in Mass-Casualty Events." *Journal of Special Operations Medicine* **14** (2014), No. 1, 30-39.
4. Mills\*, A. F., **N. T. Argon**, and S. Ziya, "Resource-Based Patient Prioritization in Mass-Casualty Incidents." *Manufacturing and Service Operations Management* **15** (2013), No. 3, 361-377. (INFORMS 2012 Doing Good with Good OR Student Competition Finalist.)
5. **Argon, N. T.**, S. Andradóttir, C., Alexopoulos, and D. Goldsman, "Steady-State Simulation with Replication-Dependent Initial Transients: Analysis and Examples." *INFORMS Journal on Computing* **25** (2013), No. 1, 177-191.
6. Uzun Jacobson\*, E., **N. T. Argon**, and S. Ziya, "Priority Assignment in Emergency Response." *Operations Research* **60** (2012), No. 4, 813-832.
7. **Argon, N. T.**, and Y.-C. Tsai\*, "Dynamic Control of a Flexible Server in an Assembly-Type Queue with Setups," *Queueing Systems* **70** (2012), No. 3, 233-268.

8. **Argon, N. T.**, and S. Ziya, "Priority Assignment under Imperfect Information on Customer Type Identities," *Manufacturing and Service Operations Management* **11** (2009), No. 4, 674-693.
9. **Argon, N. T.**, L. Ding, K. D. Glazebrook, and S. Ziya, "Dynamic Routing of Customers with General Delay Costs," *Probability in the Engineering and Informational Sciences* **23** (2009), No. 2, 175-203.
10. **Argon, N. T.**, S. Ziya, and R. Righter, "Scheduling Impatient Jobs in a Clearing System with Insights on Patient Triage in Mass-Casualty Incidents," *Probability in the Engineering and Informational Sciences* **22** (2008), No. 3, 301-332.
11. Tsai\*, Y.-C., and **N. T. Argon**, "Dynamic Server Assignment Policies for Assembly-Type Queues with Flexible Servers," *Naval Research Logistics* **55** (2008), No. 3, 234-251.
12. Aktaran-Kalayci, T., C. Alexopoulos, **N. T. Argon**, D. Goldsman, and J. R. Wilson, "Exact Expected Values of Variance Estimators in Steady-State Computer Simulation," *Naval Research Logistics* **54** (2007), No. 4, 397-410.
13. Alexopoulos, C., **N. T. Argon**, D. Goldsman, N. Steiger, G. Tokol, and J. R. Wilson, "Efficient Computation of Overlapping Variance Estimators for Simulation," *INFORMS Journal on Computing* **19** (2007), No. 3, 314-327.
14. Alexopoulos, C., **N. T. Argon**, D. Goldsman, G. Tokol, and J. R. Wilson, "Overlapping Variance Estimators for Simulation," *Operations Research* **55** (2007), No. 6, 1090-1103.
15. Alexopoulos, C., S. Andradóttir, **N. T. Argon**, and D. Goldsman, "Replicated Batch Means Variance Estimators in the Presence of an Initial Transience," *ACM Transactions on Modeling and Computer Simulation* **16** (2006), No. 4, 317-328.
16. **Argon, N. T.**, and S. Andradóttir, "Replicated Batch Means for Steady-State Simulations," *Naval Research Logistics* **53** (2006), No. 6, 508-524.
17. **Argon, N. T.**, and S. Andradóttir, "Partial Pooling in Tandem Lines with Cooperation and Blocking," *Queueing Systems* **52** (2006), No. 1, 5-30.
18. **Argon, N. T.**, R. Güllü, and N. Erkip, "Analysis of an Inventory System under Backorder-Correlated Demand and Geometric Supply Process," *International Journal of Production Economics* **71** (2001), 247-254.

#### **SUBMITTED JOURNAL ARTICLES:**

19. Mills\*, A. F., **N. T. Argon**, and S. Ziya, "Dynamic Casualty Distribution in the Aftermath of a Disaster." Third revision submitted to *Operations Research*.
20. Sun\*, Z., **N. T. Argon**, and S. Ziya, "Patient Triage and Prioritization under Austere Conditions." Third revision submitted to *Management Science*.
21. Ouyang\*, H., **N. T. Argon**, and S. Ziya, "Allocation of Intensive Care Unit Beds in Periods of High Demand." Under first revision for *Operations Research*.
22. **Argon, N. T.**, and S. Andradóttir, "Pooling in Tandem Queueing Networks with Non-collaborative Servers." Under first revision for *Queueing Systems*.

## ARTICLES SOON TO BE SUBMITTED:

23. Ouyang\*, H., **N. T. Argon**, and S. Ziya, "Priority Assignment in an M/G/1 Queue with Nonlinear Waiting Costs."
24. Sun\*, Z., **N. T. Argon**, and S. Ziya, "Priority Scheduling of Jobs with Hidden Types in Queueing Systems."

## BOOK CHAPTERS:

1. **Argon, N. T.**, "Alternating Renewal Processes," Invited Chapter, *Wiley Encyclopedia of Operations Research and Management Science*, J. J. Cochran, L. A. Cox, Jr., P. Keskinocak, J. P. Kharoufeh, and J. C. Smith (Editors), Volume 1, 92-94, Wiley, 2011. (Peer-reviewed.)
2. **Argon, N. T.**, "Delayed Renewal Processes," Invited Chapter, *Wiley Encyclopedia of Operations Research and Management Science*, J. J. Cochran, L. A. Cox, Jr., P. Keskinocak, J. P. Kharoufeh, and J. C. Smith (Editors), Volume 2, 1254-1257, Wiley, 2011. (Peer-reviewed.)
3. **Argon, N. T.**, J. Winslow, and S. Ziya, "Triage in the Aftermath of Mass-Casualty Incidents," Invited Chapter, *Wiley Encyclopedia of Operations Research and Management Science*, J. J. Cochran, L. A. Cox, Jr., P. Keskinocak, J. P. Kharoufeh, and J. C. Smith (Editors), Volume 8, 5611-5620, Wiley, 2011. (Peer-reviewed.)
4. **Argon, N. T.**, and S. Andradóttir, "Partial Pooling in Tandem Lines with Cooperation and Blocking," Invited Chapter, *The Handbook of Workforce Cross-Training*, D. Nembhard (Editor), CRC Press, 2007, 241-277. (Based on the article with the same title and authors that appeared in Queueing Systems in 2006.)

## PUBLICATIONS IN REFEREED CONFERENCE PROCEEDINGS:

5. **Argon, N. T.**, and S. Ziya, "Priority Assignment under Imperfect Information on Customer Type Identities," *Proceedings of the 2008 Service Operations Management Conference*, June 2008.
6. Alexopoulos, C., S. Andradóttir, **N. T. Argon**, and D. Goldsman, "Replicated Batch Means for Steady-State Simulations with Initial Transients," *Proceedings of the 2007 Winter Simulation Conference*, S. G. Henderson, B. Biller, M.-H., Hsieh, J. Shortle, J. D. Tew, and R. R. Barton (Editors), December 2007, 308-312.
7. Goldsman, D., J. O. Henriksen, P. L'Ecuyer, B. L. Nelson, D. H. Withers, and **N. T. Argon**, "Fortieth Anniversary Special Panel: Landmark Papers," *Proceedings of the 2007 Winter Simulation Conference*, S. G. Henderson, B. Biller, M.-H., Hsieh, J. Shortle, J. D. Tew, and R. R. Barton (Editors), December 2007, 1-12.
8. Alexopoulos, C., **N. T. Argon**, D. Goldsman, and G. Tokol, "Overlapping Variance Estimators for Simulations," *Proceedings of the 2004 Winter Simulation Conference*, R. G. Ingalls, M. D. Rosetti, J. S. Smith, and B. A. Peters (Editors), December 2004, 737-745.

9. Andradóttir, S., and **N. T. Argon**, "Variance Estimation Using Replicated Batch Means," *Proceedings of the 2001 Winter Simulation Conference*, B. A. Peters, J. S. Smith, D. J. Medeiros, and M. W. Rohrer (Editors), December 2001, 338-343.

#### **EXTENDED ABSTRACTS IN REFEREEED CONFERENCE PROCEEDINGS:**

10. **Argon, N. T.**, and S. Ziya, "Identifying the Critical Patient: Finding the Balance between Undertriage and Overtriage," *Proceedings of the 2007 M&SOM Conference*, June 2007.

#### **PUBLICATIONS IN NON-REFEREEED CONFERENCE PROCEEDINGS:**

11. **Argon, N. T.**, A. F. Mills\*, J. Winslow, and S. Ziya, "ReSTART: A New Method for Patient Prioritization in the Aftermath of Mass-Casualty Events," *Proceedings of the 2011 NSF CMMI Grantees Conference*.
12. **Argon, N. T.**, J. Winslow, S. Ziya, and E. Uzun\*, "Scheduling in Clearing Systems with Abandonments and Implications for Mass-Casualty Triage," *Proceedings of the 2009 NSF CMMI Grantees Conference*.
13. **Argon, N. T.**, J. Winslow, and S. Ziya, "Dynamic Programming Approach for Patient Triage in Mass-Casualty Incidents," *Proceedings of the 2008 NSF CMMI Grantees Conference*.
14. Andradóttir, S., and **N. T. Argon**, "Partial Pooling for Improving the Performance of Tandem Queues," *Proceedings of the 2005 NSF DMII Grantees Conference*.

#### **THESES:**

15. "Performance Enhancements in Tandem Queueing Networks and Confidence Interval Estimation in Steady-State Simulations," Ph.D. Dissertation, School of Industrial and Systems Engineering, Georgia Institute of Technology, Atlanta, Georgia, USA, November 2002.
16. "Analysis of a Production/Inventory System under Backorder-Correlated Demand," M.S. Thesis in Industrial Engineering, Middle East Technical University, Ankara, Turkey, July 1998.

#### **INVITED PRESENTATIONS AT COLLOQUIA AND SEMINARS:**

1. "Priority Scheduling of Patients in Mass-Casualty Incidents," Fuqua School of Business, Duke University, Durham, North Carolina, USA, October 2010.
2. "Patient Triage in the Aftermath of a Mass-Casualty Incident," Department of Biostatistics, Reinforcement Learning Study Group, University of North Carolina, Chapel Hill, North Carolina, USA, January 2009.
3. "Priority Scheduling of Patients in Mass-Casualty Incidents," Department of Industrial and Systems Engineering, North Carolina State University, Raleigh, North Carolina, USA, November 2008.
4. "Dynamic Assignment of Flexible Servers in Assembly-Type Queueing Systems," Department of Statistics and Operations Research, University of North Carolina, Chapel Hill, North Carolina, USA, April 2006.

5. "Performance Improvements in Tandem Queueing Networks and Splitting Systems with Flexible Servers," Department of Industrial Engineering and Management Sciences, Northwestern University, Evanston, Illinois, USA, November 2004.
6. "Pooling in Tandem Lines with Blocking and Cooperation," Department of Mechanical Engineering, University of Memphis, Memphis, Tennessee, USA, April 2002.
7. "Pooling in Tandem Lines and Steady-State Simulations," Department of Industrial and Systems Engineering, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, USA, March 2002.
8. "Pooling in Tandem Lines and Steady-State Simulations," Department of Industrial Engineering, University of Wisconsin, Madison, Wisconsin, USA, March 2002.
9. "Pooling in Tandem Lines and Steady-State Simulations," Department of Operations Research, University of North Carolina, Chapel Hill, North Carolina, USA, February 2002.
10. "Replicated Batch Means in Steady-State Simulations," Seminar Series in Applied Probability, Georgia Institute of Technology, Atlanta, Georgia, USA, February 2002.
11. "Partial Pooling in Tandem Lines with Blocking and Cooperation," Seminar Series in Applied Probability, Georgia Institute of Technology, Atlanta, Georgia, USA, April 2001.

#### **INVITED CONFERENCE PRESENTATIONS:**

1. N. T. Argon, A. F. Mills, and S. Ziya. "Dynamic Casualty Distribution in the Aftermath of a Disaster," INFORMS Applied Probability Society Conference, Istanbul, Turkey, July 2015.
2. N. T. Argon, C. Deng, V. Kulkarni. "Dynamic Server Assignment in a Finite-population Queueing System," INFORMS Annual Meeting, Minneapolis, Minnesota, USA, October 2013.
3. N. T. Argon, A. F. Mills, and S. Ziya. "Resource-based Patient Prioritization in Mass-casualty Incidents," 26<sup>th</sup> European Conference on Operational Research, Rome, Italy, July 2013.
4. N. T. Argon, "Control of Queueing Systems with Sequencing Flexibility," INFORMS Annual Meeting, Charlotte, North Carolina, USA, November 2011.
5. N. T. Argon, "Control of Queueing Systems with Sequencing Flexibility," INFORMS Applied Probability Society Conference, Stockholm, Sweden, July 2011.
6. N. T. Argon and E. Uzun, "Priority Scheduling in Queueing Systems with Impatient Customers," INFORMS Annual Meeting, Austin, Texas, USA, November 2010.
7. N. T. Argon and Y.-C. Tsai, "Dynamic Control of a Make-to-order Manufacturing System with a Flexible Server and Setups," INFORMS Applied Probability Society Conference, Ithaca, New York, USA, July 2009.
8. N. T. Argon and S. Ziya, "Priority Scheduling in a Queueing System with Hidden Customer Type Identities," INFORMS Applied Probability Society Conference, Ithaca, New York, USA, July 2009.

9. N. T. Argon and Y.-C. Tsai, "Dynamic Control of a Flexible Server in an Assembly System with Setups," INFORMS Annual Meeting, Washington, D.C., USA, October 2008.
10. N. T. Argon, C. Alexopoulos, S. Andradóttir, and David Goldsman, "Replicated Batch Means for Steady-State Simulations with Initial Transients," Winter Simulation Conference, Washington, D.C., USA, December 2007.
11. N. T. Argon and Y.-C. Tsai, "Optimal Control of a Flexible Server in an Assembly System with Setups," INFORMS Annual Meeting, Seattle, Washington, USA, November 2007.
12. N. T. Argon and S. Ziya, "A Dynamic Programming Approach for Triage in the Aftermath of a Major Emergency," INFORMS Annual Meeting, San Francisco, California, USA, November 2005.
13. N. T. Argon and Y.-C. Tsai, "Dynamic Assignment of Flexible Servers in a Splitting System," INFORMS Applied Probability Society Conference, Ottawa, Canada, July 2005.
14. N. T. Argon and S. Andradóttir, "Pooling in Queueing Networks with Cooperation and Blocking," INFORMS Annual Meeting, Denver, Colorado, USA, October 2004.
15. N. T. Argon and Y.-C. Tsai, "Server Assignment Policies in Splitting Systems with Cross-Trained Servers," INFORMS Annual Meeting, Denver, Colorado, USA, October 2004.
16. N. T. Argon and S. Andradóttir, "Partial Pooling in Tandem Lines with Cooperation and Blocking," INFORMS Annual Meeting, Atlanta, Georgia, USA, October 2003.
17. N. T. Argon and S. Andradóttir, "Confidence Interval Estimation Using Replicated Batch Means," INFORMS Annual Meeting, Miami, Florida, USA, November 2001.

#### **CONTRIBUTED PRESENTATIONS:**

1. N. T. Argon, C. Alexopoulos, D. Goldsman, and G. Tokol, "Overlapping Variance Estimators for Simulations," Winter Simulation Conference, Washington, D.C., USA, December 2004.
2. N. T. Argon and S. Andradóttir, "Partial Pooling in Tandem Lines with Blocking and Cooperation," Sixth Annual Southeastern Probability Days, Georgia Institute of Technology, Atlanta, Georgia, USA, April 2002.
3. N. T. Argon and S. Andradóttir, "Variance Estimation Using Replicated Batch Means," Winter Simulation Conference, Washington, D.C., USA, December 2001.
4. N. T. Argon and S. Andradóttir, "Replicated Batch Means for Steady-State Simulation," Winter Simulation Conference Doctoral Colloquium, Washington, D.C., USA, December 2001.
5. N. T. Argon and S. Andradóttir, "Pooling in Tandem Lines with Blocking and Cooperation," INFORMS Annual Meeting, Miami, Florida, USA, November 2001.
6. N. T. Argon, R. Güllü, and N. Erkip, "Base Stock Inventory Policies under Backorder Correlated Demands and Markov-Modulated Supply Processes," National Conference on Operations Research and Industrial Engineering, Ankara, Turkey, June 1998 (in Turkish).

## **COURSES TAUGHT AT UNIVERSITY OF NORTH CAROLINA:**

1. STOR 113: Decision Models for Economics (undergraduate), Fall 2007 (93 students), Fall 2009 (102 students), Spring 2012 (86 students), Fall 2013 (102 students), and Fall 2015 (107 students)
2. STOR 445: Stochastic Models in Operations Research (undergraduate), Fall 2008 (19 students) and Fall 2012 (48 students)
3. STOR 465: Simulation Analysis and Design (undergraduate), Spring 2010 (10 students), Spring 2011 (11 students), Spring 2012 (11 students), Spring 2013 (15 students), Spring 2014 (14 students), Spring 2015 (20 Students) and Spring 2017 (44 students)
4. STOR 641: Stochastic Models in Operations Research I (graduate), Fall 2009 (18 students)
5. STOR 743: Stochastic Models in Operations Research III (advanced graduate), Fall 2013 (14 students) and Fall 2015 (11 students)
6. STOR 762: Discrete Event Simulation (graduate), Fall 2006 (7 students), Spring 2008 (17 students), Spring 2009 (16 students), Spring 2010 (6 students), Spring 2011 (11 students), Spring 2012 (9 students), Spring 2013 (16 students), Spring 2014 (10 students), Spring 2015 (8 students), Spring 2016 (8 students), and Spring 2017 (8 students)
7. STOR 890: Design and Control of Queueing Systems with Applications to Manufacturing and Health Care (advanced graduate), Spring 2008 (5 students), Fall 2010 (12 students), and Fall 2014 (9 students)

## **COURSES TAUGHT AT UNIVERSITY OF WISCONSIN:**

8. Simulation Modeling and Analysis (graduate), (2005, 2006)
9. Simulation and Probabilistic Modeling (undergraduate), (2003, 2004, 2005, 2006)
10. Queueing Theory and Stochastic Modeling (graduate), (2004, 2005)
11. Stochastic Modeling in Health Care Delivery and Emergency Response Planning (graduate), (2005)
12. Discrete Event Simulation (advanced graduate), (2004)
13. Stochastic Models of Production Flow Lines (advanced graduate), (2003)

## **DOCTORAL STUDENT SUPERVISION:**

1. Zheqi Zhang. Expected graduation: May 2019. Co-supervised with Serhan Ziya.
2. Wanyi Chen. Expected graduation: May 2018. Co-supervised with Serhan Ziya.
3. Huiyin Ouyang. Graduated in August 2016. Dissertation title: "Prioritization in Service Systems with Nonlinear Delay Costs." Co-supervised with Serhan Ziya. Current position: Postdoctoral fellow at Northwestern University.

4. Zhankun Sun. Graduated in December 2014. Dissertation title: "Priority Scheduling of Jobs with Unknown Types." Co-supervised with Serhan Ziya. Current position: Assistant Professor of Management Sciences, City University of Hong Kong, China.
5. Chao Deng. Graduated in December 2012. Dissertation title: "Optimal Design and Control of Finite-Population Queueing Systems." Co-supervised with Vidyadhar Kulkarni. Current position: Data scientist at Alibaba, China.
6. Alex Mills. Graduated in December 2012. Dissertation title: "Patient Prioritization in a Mass-Casualty Incident with Resource Limitations." Co-supervised with Serhan Ziya. Current position: Assistant Professor, Kelley School of Business, Indiana University, Bloomington, Indiana, USA.
7. Yi-Chun Tsai. Ph.D. requirements completed in May 2011 (University of Wisconsin). Dissertation title: "Control and Design of Assembly-type Queueing Systems." Current position: Statistical analyst at Discover Financial Services, Chicago, Illinois, USA.
8. Evin Uzun Jacobson. Graduated in December 2010. Dissertation title: "Scheduling in Service Systems with Impatient Customers and Insights on Mass-casualty Triage." Current position: Research fellow at Center for Disease Control and Prevention, Atlanta, Georgia, USA.

#### **MASTERS STUDENT SUPERVISION:**

1. Yan Hai. "A Discrete-Event Simulation of UNC Emergency Department" Graduated in May 2014. Co-supervised with Serhan Ziya.
2. Firat Kilci. "Restarted Batch Means: When and How to Restart?" Graduated in May 2014.
3. Gan Liu. "A Review on Emergency Department Modeling." Graduated in May 2014. Co-supervised with Serhan Ziya.
4. Virginia Ahalt. "Modeling and Analysis of ED Room Crowding." Graduated in May 2013. Co-supervised with Serhan Ziya.
5. Shemra Rizzo. "Mathematical Models for Breast Cancer Screening Decisions." Graduated in May 2010.
6. Anushree Goyal. "Pooling in Queueing Systems." Graduated in May 2009.
7. Gurmeet Arora. "A Comparison of Multiple Replications and Batch Means Methods for Steady-State Simulations." Graduated in May 2009.
8. Remya Chandran. "Throughput Maximization in Production Flow Lines with Cross-Trained Workers." Graduated in August 2008.
9. Pranav Gupta. "A Computational Study on Patient Triage in the Aftermath of Mass-Casualty Incidents." Graduated in May 2007. Co-supervised with Serhan Ziya.

#### **UNDERGRADUATE STUDENT SUPERVISION:**

1. Emily Riederer. "Improving Patient Flow through Early Bed Requests at UNC Hospital ED: A Discrete-Event Simulation Study." Fall 2015 – Spring 2016. Co-supervised with Serhan Ziya.

2. Yevgeniy Grechka. "A Dynamic Programming Formulation for the Mass-Casualty Triage Problem." Spring 2009 – Fall 2010.
3. Molly Dunn and Natalie Mandaville. "A Simulation Study on Sequencing Flexibility in Tandem Queueing Networks." (University of Wisconsin) Fall 2004.

## RESEARCH GRANTS AWARDED:

1. **Principal Investigator**, "Collaborative Research: Distribution of Patients to Medical Facilities in Mass-Casualty Events," *National Science Foundation*, CMMI, Period: 09/01/2016 - 08/31/2019. Collaborators: Serhan Ziya (University of North Carolina), Lane Smith (Wake Forest University), and James Winslow (Wake Forest University), Total Project Budget: \$379,408, Total UNC Budget: \$325,078, N. T. Argon's Budget: \$162,539.
2. **Investigator**, "Quantifying Patient Complexity to Improve Emergency Department Performance," *Innovation Pilot Grant Award -- UNC Health Care and the School of Medicine*. Period: 06/01/2015 - 05/31/2016. Collaborators: Debbie Travers (Co-Principle Investigator, UNC School of Nursing); Abhi Mehrotra (Co-Principle Investigator, UNC Department of Emergency Medicine); Serhan Ziya (Co-Investigator, UNC Department of Statistics and Operations Research); Jeff Strickler (Co-Investigator, UNC Healthcare); Kenneth Lopian and Thomas Bohrman (Consultants, Roundtable Analytics). Total Project Budget: \$49,981.
3. **Principal Investigator**, "Collaborative Research: In Search of the Greatest Good with Imperfect Triage in the Aftermath of Mass-Casualty Events," *National Science Foundation*, CMMI, Period: 09/01/2012 - 08/31/2015. Collaborators: Serhan Ziya (University of North Carolina) and James Winslow (Wake Forest University), Total Project Budget: \$459,817, Total UNC Budget: \$390,000, N. T. Argon's Budget: \$195,000.
4. **Consultant**, "A Simulation Model for Understanding Prevention and Treatment of Depression Among HIV+ Women," *National Science Foundation*, Period: 09/01/2012 - 08/31/2015. Principal Investigator: Michael Foster (University of Alabama, Birmingham). Total Project Budget: \$471,672. N. T. Argon's Budget: \$31,967.
5. **Investigator**, "The Childhood Obesity Policy and Comparative Effectiveness Model," *National Institutes of Health*, Period: 09/15/2011 - 06/30/2013. Principal Investigators: Michael Foster (University of Alabama, Birmingham) and Asheley Skinner. Total Project Budget: \$275,000. N. T. Argon's Budget: \$9,400.
6. **Principal Investigator**, "Collaborative Research: Priority Dispatching of Patients in the Aftermath of a Mass-Casualty Event," *National Science Foundation*, CMMI, Period: 09/01/2009 - 08/31/2013. Collaborators: Serhan Ziya (University of North Carolina) and James Winslow (Wake Forest University), Total Project Budget: \$397,000, Total UNC Budget: \$360,443, N. T. Argon's Budget: \$180,000.
7. **Principal Investigator**, "Collaborative Research: Patient Triage in the Aftermath of a Mass Casualty Event - A Dynamic Programming Approach," *National Science Foundation*, CMMI, Period: 11/27/2006 - 08/31/2010. Collaborators: Serhan Ziya (University of North Carolina) and James Winslow (Wake Forest University), Total

Project Budget: \$350,000, Total UNC Budget: \$312,461, N. T. Argon's Budget: \$156,395.

8. **Principal Investigator**, "Sequencing Flexibility in Queueing Networks and its Application to Electronics Manufacturing," *2008 Junior Faculty Development Award (IBM Fund Award)*, University of North Carolina at Chapel Hill. Budget: \$7,500.
9. **Principal Investigator**, "Patient Dispatching and Triage in the Aftermath of a Mass Trauma Event," *Fall 2005 Competition of the Graduate School Research Committee*, University of Wisconsin-Madison. Period: 07/01/2006 - 06/30/2007. Budget: \$18,120.
10. **Principal Investigator**, "Capacity Maximization in a Queueing Network with Cross-trained Servers and Flexible Sequencing," *Fall 2004 Competition of the Graduate School Research Committee*, University of Wisconsin-Madison. Period: 07/01/2005 - 06/30/2006. Budget: \$26,208.
11. **Principal Investigator**, "Performance Enhancements in Tandem Queueing Networks Using Existing Resources," *Fall 2003 Competition of the Graduate School Research Committee*, University of Wisconsin-Madison. Period: 07/01/2004 - 06/30/2005. Budget: \$25,764.

## CONFERENCE ORGANIZATION:

1. Cluster co-chair for the sponsored sessions by the Applied Probability Society, INFORMS Annual Meeting, Minneapolis, Minnesota, USA, October 2013.
2. Track co-chair for "Simulation Education," Winter Simulation Conference, Washington, D.C., USA, December 2013.
3. Interactive sessions co-chair, INFORMS Annual Meeting, Charlotte, North Carolina, USA, November 2011.
4. Cluster chair for the "Landmark Papers," Winter Simulation Conference, Washington, D.C., USA, December 2007.
5. Cluster co-chair for invited sessions in "Workforce Flexibility," INFORMS Annual Meeting, San Francisco, California, USA, November 2005.

## CONFERENCE SESSIONS ORGANIZED AND CHAIRED:

1. "Health Care Operations and Capacity Planning," INFORMS Annual Meeting, Nashville, Tennessee, USA, November 2016. (Co-organized with Serhan Ziya.)
2. "Health Care Operations," INFORMS Annual Meeting, Philadelphia, Pennsylvania, USA, November 2015. (Co-organized with Serhan Ziya.)
3. "Stochastic Modeling for Healthcare Operations," INFORMS Applied Probability Society Conference, Istanbul, Turkey, July 2015.
4. "Stochastic Models in Health Care," INFORMS Annual Meeting, San Francisco, California, USA, October 2014.
5. "Stochastic Modeling in Health-Care Applications," INFORMS Annual Meeting, Phoenix, Arizona, USA, October 2012. (Chaired by Alex F. Mills.)

6. "Analysis, Design, and Control of Queueing Systems," INFORMS Annual Meeting, Charlotte, North Carolina, USA, November 2011.
7. "Simulation-Based Dynamic Decision Making Methods," Winter Simulation Conference, Baltimore, Maryland, USA, December 2010.
8. "Analysis and Control of Queueing Systems," INFORMS Annual Meeting, Austin, Texas, USA, November 2010.
9. "Analyses of Several Public Health Problems and Solutions," INFORMS Annual Meeting, Austin, Texas, USA, November 2010.
10. "Scheduling in Queueing Systems," INFORMS Applied Probability Society Conference, Ithaca, New York, USA, July 2009.
11. "Capacity Planning and Scheduling in Health Care," INFORMS Annual Meeting, Washington D. C., USA, October 2008.
12. "Control of Queueing Systems with Flexible Servers," INFORMS Annual Meeting, Washington D. C., USA, October 2008.
13. "Stochastic Control in Workforce Engineering," INFORMS Annual Meeting, Seattle, Washington, USA, November 2007.
14. "Input Modeling," Winter Simulation Conference, Washington, D.C., USA, December 2004. (Organized by the conference committee.)
15. "Dynamic Resource Allocation in Queueing Networks," INFORMS Annual Meeting, Denver, Colorado, USA, October 2004.
16. "Simulation-Based Optimization," Winter Simulation Conference, New Orleans, Louisiana, USA, December 2003. (Organized by the conference committee.)
17. "Batching Methods for Simulation Output Analysis," INFORMS Annual Meeting, Atlanta, Georgia, USA, October 2003.

#### **OTHER PROFESSIONAL ACTIVITIES:**

- **Area Editor**, Stochastic Modeling, Wiley Encyclopedia of Operations Research and Management Science, Second Edition, 2016 – present.
- **Associate Editor**, Health Care Management Science, 2016 – present
- **Secretary**, INFORMS Simulation Society, 2006 – 2008.
- **Communications Committee Member**, INFORMS Simulation Society, 2012 – 2014.
- **Council Member**, INFORMS Applied Probability Society, 2012 – 2014.
- **Member**:

Institute for Operations Research and the Management Sciences (INFORMS), 2001 – present

INFORMS Applied Probability Society, 2001 – present

INFORMS Simulation Society, 2001 – present

INFORMS Manufacturing and Service Operations Management Society, 2008 – present

INFORMS Health Applications Society, 2008 – present  
INFORMS Women in OR/MS Forum, 2005 – present

- **Referee** (in alphabetical order):  
ACM Transactions on Modeling and Computer Simulation  
European Journal of Operational Research  
Health Care Management Science  
IEEE Transactions on Automated Science and Engineering  
IIE Transactions  
INFORMS Journal on Computing  
Management Science  
Manufacturing and Service Operations Management  
Naval Research Logistics  
Networks  
Operations Research
- **Invited reviewer:**  
MSOM Student Paper Competition (2016)  
INFORMS George Nicholson Student Paper Competition (2010, 2011, 2017)  
National Science Foundation (2004, 2008, 2010, 2012, 2014, 2016)  
Natural Sciences and Engineering Research Council of Canada (2009)
- **Invited panelist**, "Industrial and Systems Engineering and Health Care: Critical Areas of Research Workshop," sponsored by the Agency for Healthcare Research and Quality and the National Science Foundation, Washington, D.C., USA, September 2009.
- **Local scientific coordinator**, "Data-driven Decisions in Healthcare," SAMSI (Statistical and Applied Mathematical Sciences Institute) 2012-2013 program, Research Triangle Park, North Carolina, USA.

#### **COMMITTEES, UNIVERSITY OF NORTH CAROLINA:**

- **Departmental diversity liaison to the College of Arts and Sciences**, May 2012 – present
- **Director of Graduate Studies for Operations Research**, August 2014 – present
- **Academic advisor**, Mathematical Decision Sciences, August 2008 – present
- **Instructional mentor**, STOR 112/113, August 2009 – August 2014
- **Member**, Department Chair Nomination Committee, Spring 2014
- **Member**, Faculty Recruiting Committee, August 2007 – August 2008; August 2012 – August 2013
- **Co-organizer**, Statistics and Operations Research Colloquium, August 2007 – August 2013

#### **COMMITTEES, UNIVERSITY OF WISCONSIN:**

- **Chair**, Stochastic Systems Qualifying Exam Committee, 2004 – 2006

- **Member:**

Equity and Diversity Committee of College of Engineering, 2003 – 2006

Graduate Student Recruiting and Admissions Committee, 2003 – 2006

Graduate Policy and Exams Committee, 2004 – 2005

Student Advisory Committee, 2005 – 2006

Performance Evaluation Qualifying Exam Committee, 2003 – 2006

Quantitative Decision Making Qualifying Exam Committee, 2003 – 2006

## **HONORS AND AWARDS:**

- Junior Faculty Development Award, 2008, University of North Carolina at Chapel Hill, NC, USA.
- Sponsorship award given by the Committee on Under-represented Minorities and Women (CUMW) of the INFORMS College on Simulation, Winter Simulation Conference, Washington, D.C., USA, December 2001.
- Sponsorship award given by the INFORMS College on Simulation for participation in the Doctoral Colloquium, Winter Simulation Conference, Washington, D.C., USA, December 2001.

**Exhibit 2 to Argon Declaration**

